

Serial No. 10/647,057

Docket No. 30296A-DIV1

Listing of Claims:

1-3. (Canceled)

4. (Currently amended) ~~The An isolated nucleic acid sequence of claim 1, said~~
~~that comprises a nucleotide sequence having comprising~~ at least about 87% sequence homology with
~~a the nucleotide sequence selected from the group consisting of SEQ ID NO: 8, Nos. 8-14 SEQ ID~~
~~NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and~~
~~combinations thereof; wherein said nucleotide sequence encodes a polypeptide that induces anti-~~
~~leukotoxin antibodies in a mammal, when administered to said mammal.~~

5-8. (Canceled)

9. (Currently amended) ~~The An expression vector that comprises the isolated~~
~~nucleic acid of claim 4 6, said nucleotide sequence having at least about 87% sequence homology~~
~~with a sequence selected from the group consisting of Nos. 8-14.~~

10. (Canceled)

11. (Currently Amended) ~~A An isolated variant nucleic acid nucleotide sequence~~
which differs from that ~~the isolated nucleic acid of claim 4 1;~~ due to a mutation event selected from
the group consisting of a point ~~mutation mutations, a deletion deletions, an insertion insertions, and~~
~~a rearrangement; rearrangements wherein said variant nucleic acid comprises at least 87% sequence~~
~~homology with at least 1,017 contiguous nucleotides of the nucleotide sequence of SEQ ID NO: 8;~~
~~and wherein said variant nucleic acid encodes a polypeptide that induces anti-leukotoxin antibodies~~
~~in a mammal, when administered to said mammal.~~

Serial No. 10/647,057

Docket No. 30296A-DIV1

12. (Withdrawn) A vaccine effective for conferring protective immunity against *F. necrophorum* comprising the protein expressed by a portion of SEQ ID No. 8 and a suitable pharmacologically compatible carrier.

13. (Withdrawn) The vaccine of claim 12, said vaccine being prepared by a method comprising the steps of:

- a) providing the *F. necrophorum* gene which expresses leukotoxin;
- b) truncating said *F. necrophorum* gene into a plurality of discrete nucleotide sequences, each of said discrete nucleotide sequences encoding for a respective polypeptide sequence;
- c) expressing and recovering said encoded polypeptide sequence expressed by at least one of said discrete nucleotide sequences;
- d) inactivating said recovered polypeptide sequence; and
- e) combining said inactivated polypeptide sequence with said suitable pharmacologically compatible carrier to produce said vaccine.

14. (Withdrawn) The vaccine of claim 13, said discrete nucleotide sequences having a sequence having at least about 50% sequence homology with a sequence selected from the group consisting of SEQ ID Nos. 9-14.

15. (Withdrawn) The vaccine of claim 13, further comprising the step of expressing and recovering said respective polypeptides using said nucleotide.

16. (Canceled)

17. (Currently amended) ~~The A recombinant nucleic acid sequence of claim 1,~~
~~said that comprises a nucleotide sequence having comprising~~ at least about 87% sequence homology
with a nucleotide sequence selected from the group consisting of SEQ ID ~~NO: 8, Nos. 8-14~~ SEQ

Serial No. 10/647,057

Docket No. 30296A-DIV1

ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and combinations thereof; wherein said nucleotide sequence encodes a polypeptide that when administered to a mouse confers effective protective immunity against *F. necrophorum* in said mouse.

18-19. (Canceled)

20. (New) An isolated nucleic acid encoding a polypeptide that comprises an amino acid sequence comprising at least 339 contiguous amino acids from SEQ ID NO: 1; wherein, when said polypeptide is administered to a mammal, anti-leukotoxin antibodies are induced in said mammal.

21. (New) The isolated nucleic acid of claim 20; wherein said polypeptide is recognized by anti-native leukotoxin antibodies.

22. (New) The isolated nucleic acid of claim 20; wherein antisera comprising the anti-leukotoxin antibodies induced in said mammal recognize native leukotoxin.

23. (New) The isolated nucleic acid of claim 20; wherein antisera comprising the anti-leukotoxin antibodies induced in said mammal neutralize the activity of native leukotoxin towards polymorphonuclear leukocytes in an *in vitro* assay.

24. (New) The isolated nucleic acid of claim 20; wherein said nucleic acid ranges in size from 1.1 kilobases to 2.8 kilobases.

25. (New) The isolated nucleic acid of claim 20; wherein said polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, and combinations thereof.

Serial No. 10/647,057

Docket No. 30296A-DIV1

26. (New) An expression vector that comprises the isolated nucleic acid of claim 20.

27. (New) An expression vector that comprises the isolated nucleic acid of claim 25.

28. (New) A recombinant nucleic acid that comprises a portion of SEQ ID NO: 8 and encodes a polypeptide that comprises an amino acid sequence comprising at least 339 contiguous amino acids from SEQ ID NO: 1; wherein when said polypeptide is administered to a mouse it confers effective protective immunity against *F. necrophorum* in said mouse.

29. (New) A variant nucleic acid which differs from the isolated nucleic acid of claim 20 due to a mutation event selected from the group consisting of a point mutation, a deletion, an insertion, and a rearrangement; wherein said variant nucleic acid comprises at least 87% sequence homology with at least 1,017 contiguous nucleotides of the nucleotide sequence of SEQ ID NO: 8; and wherein said variant nucleic acid encodes a polypeptide that induces anti-leukotoxin antibodies in a mammal, when administered to said mammal.